

**AMENDMENTS TO THE CLAIMS**

Please make the following amendments to the claims:

1. (Currently Amended) A system for ~~data communication~~ interleaving trellis codes, comprising:
  - a precoder state element configured to monitor a precoder state and to develop a series of precoder symbols;
  - an interleaver configured to receive and interleave the precoder symbols;
  - a trellis state element configured to receive the interleaved symbols and to develop a trellis state output; and
  - a trellis encoder configured to receive the trellis state output and to generate at least one redundant bit.
2. (Previously Presented) The system of claim 1, further comprising a feedback precoder configured to maintain the magnitude of a transmit signal at a predefined level, wherein the precoder state is a state of the feedback precoder.
3. (Previously Presented) The system of claim 2, wherein the precoder state defines changes in the transmit signal that occur as a result of feedback precoder actions.
4. (Previously Presented) The system of claim 1, wherein the interleaver is configured to store the precoder symbols in a first sequence, and the trellis state element is configured to receive the precoder symbols from the interleaver in a second sequence.

5. (Previously Presented) The system of claim 1, further comprising a constellation encoder configured to receive the redundant bit and at least one data bit and to generate a transmit signal based on the redundant bit and the data bit.

6. (Currently Amended) A method of data communication for interleaving trellis codes, comprising the steps of:

producing a series of precoder symbols;  
interleaving the precoder symbols;  
producing a trellis state output from the interleaved symbols; and  
generating a redundant bit based upon the trellis state output.

7. (Currently Amended) The method of claim 6, further comprising the step of:  
maintaining ~~the magnitude of~~ a transmit signal magnitude at a predefined level.

8. (Currently Amended) The method of claim 7, wherein the precoder state defines changes in the transmit signal that occur as a result of maintaining ~~the magnitude of~~ the transmit signal magnitude.

9. (Currently Amended) The method of claim 6, further comprising the step of:  
storing the precoder symbols in a first sequence; and [[s]]  
receiving the precoder symbols from the interleaver in a second sequence.

10. (Currently Amended) The method of claim 6, further comprising the step of  
encoding a transmit signal using the redundant bit and at least one data bit.

11. (Currently Amended) A system for ~~data communication~~ interleaving trellis codes, comprising:

means for producing a series of precoder symbols;  
means for interleaving the precoder symbols;  
means for producing a trellis state output from the interleaved symbols; and  
means for generating a redundant bit based upon the trellis state output.

12. (Currently Amended) The system of claim 11, further comprising a means for maintaining ~~the magnitude of a transmit signal~~ magnitude at a predefined level.

13. (Currently Amended) The system of claim 12, wherein the precoder state defines changes in the transmit signal that occur as a result of actions by the means for maintaining ~~the magnitude of the transmit signal~~ magnitude.

14. (Previously Presented) The system of claim 11, further comprising:  
means for storing the precoder symbols in a first sequence; and  
means for receiving the precoder symbols from the interleaver in a second sequence.

15. (Previously Presented) The system of claim 11, further comprising means for encoding a transmit signal using the redundant bit and at least one data bit.

16. (Currently Amended) A system for ~~data communication~~ interleaving trellis codes, comprising:

a precoder configured to receive a first constellation associated with a trellis state and to produce a trellis symbol associated with the trellis state and to produce a precoder state associated with the first constellation;

a precoder state element configured to receive the precoder state and to produce a trellis symbol associated with a trellis state;

an interleaver configured to receive a first sequence of the trellis symbols and to produce a second sequence of the trellis symbols;

a trellis state ~~decoder~~ element configured to receive the interleaved trellis symbols and to produce a trellis state for each of the interleaved symbols, where the trellis state is associated with the first constellation; and

a trellis encoder configured to receive the trellis state and to produce a ~~redundant redundant~~ bit based on the trellis state.

17. (Previously Presented) The system of claim 16, further comprising:

a constellation encoder configured to produce the first constellation based on the redundant bit.

18. (Previously Presented) The system of claim 16, wherein the precoder is further configured to produce a second constellation with altered power characteristics.

19. (Currently Amended) A method for interleaving trellis codes in a data communications system comprising the steps of:

generating a trellis symbol representing a trellis state of a first signal constellation;  
interleaving a plurality of the trellis symbols;  
determining the trellis state associated with each of the trellis symbols; and  
trellis encoding based on the trellis state to produce a redundant bit.

20. (Currently Amended) The method of claim 19, further comprising the steps of:  
precoding the first signal constellation to produce a second signal constellation; and  
transmitting the second signal constellation.

21. (Previously Presented) The method of claim 19, wherein the interleaving step  
further comprises:  
receiving the plurality of trellis symbols in a first sequence; and  
producing a second sequence of the plurality of trellis symbols.

22. (Previously Presented) The method of claim 19, wherein the determining step  
further comprises:

slicing each of the trellis symbols to determine a vector  $y(n)$  associated with each of the  
trellis symbols.

23. (New) A modem that includes the system of claim 1.

24. (New) A modem that implements the method of claim 6.

25. (New) A modem that includes the system of claim 11.

26. (New) A modem that includes the system of claim 16.

27. (New) A modem that implements the method of claim 19.